

## METHOD AND APPARATUS FOR SYNTHESIS OF ARRAYS OF DNA PROBES

### ABSTRACT OF THE DISCLOSURE

5       The synthesis of arrays of DNA probes sequences, polypeptides, and the  
like is carried out using a patterning process on an active surface of a substrate. An  
image is projected onto the active surface of the substrate utilizing an image former  
that includes a light source that provides light to a micromirror device comprising an  
array of electronically addressable micromirrors, each of which can be selectively tilted  
between one of at least two positions. Projection optics receives the light reflected  
10    from the micromirrors along an optical axis and precisely images the micromirrors  
onto the active surface of the substrate, which may be used to activate the surface of  
the substrate. The first level of bases may then be applied to the substrate, followed by  
development steps, and subsequent exposure of the substrate utilizing a different  
pattern of micromirrors, with further repeats until the elements of a two dimensional  
15    array on the substrate surface have an appropriate base bound thereto. The  
micromirror array can be controlled in conjunction with a DNA synthesizer supplying  
appropriate reagents to a flow cell containing the active substrate to control the  
sequencing of images presented by the micromirror array in coordination of the  
reagents provided to the substrate.